THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR JULY 1883.

ARTICLE I.

CASES OF LESIONS OF PERIPHERAL NERVE-TRUNKS, WITH COMMENTARIES.

By S. WEIR MITCHELL, M.D., Member of the National Academy of Sciences, U. S. A.

CASE I. *Peculiar Nutritive Changes of Palm and Back of Hand ascribed to Milking; Herpes; Neuralgia; Elongation of Median Nerve; Section of Radial Nerve.*—L. C., æt. 40, first came to the Infirmary for Nervous Diseases in Nov. 1880, with the following brief history: Some ten years ago she noticed a numbness in the palm of the right hand, apparent, however, only when milking cows, though six months later she also observed it during ironing. Succeeding this "numbness," pain made itself manifest, affecting the palm and all the fingers of the hand, but not extending up the arm. This condition grew gradually worse, until two years ago she was unable to make use of the hand on account of the suffering. The trouble was most apparent in the morning when first awakening, and was increased both in extent and intensity by cold, while warmth or pressure in a measure relieved it. On examination the pain was found to be located in the palm between the second and third metacarpal bones, and to extend through to the dorsal aspect of the hand. No pain was felt elsewhere, nor did pressure along any of the nerve tracts either of the hand or arm disclose any other painful spot, although a callosity about the size of a pea was noticed upon the anterior surface of the wrist. Sensation as to touch appeared to be normal, and the muscles were firm and well developed, though the dynamometer indicated a loss of strength in the affected hand. There was, however, neither muscular atrophy, contractions, joint disease, glossy skin, nor even the changes in nail-growth which usually accompany impairment of nutrition.

Some three months ago a herpetic eruption made its appearance in a small area on the back of the affected hand. She has also presented for some years on the face and breast a bronzed appearance similar to the bronzing of Addison's disease. Beyond the points mentioned she was in excellent general health. At the time of her first visit, sulphate of strychnia was prescribed, one-fortieth gr. t. d., and she was directed to increase the dose to the one-twentieth gr., while the lactate of iron was also ordered in doses of three grs. t. d.

In April, 1881, she returned, reporting considerable improvement. The eruption, however, had become a distinct sore, eczematous in character, and some little time previous it had begun to discharge a thin, grayish-yellow pus, although the diseased region was not painful to the touch; whenever it healed, and the discharge ceased, the pain became much worse. She was given Fowler's solution at the time of her second visit, beginning with five drops t. d., and the amount gradually increased till toxic effects were produced. Galvanism was also ordered to be applied to the hand and arm with special reference to the median and musculo-spiral nerves, one electrode being placed over the sore spot in the hand. During May and June, 1881, she received twenty-eight applications of the continuous galvanic current, which acted very favourably. The pain in the hand lessened so considerably as to cause but little trouble, while the sore on the back of the hand gradually healed. There was no longer any discharge or desquamation, and all that was left was a spot of reddened and somewhat hypertrophied skin. In August the trouble again became worse, and a small abscess of the size of a pea formed on the back of the hand, between the first and second metacarpal bones. Following this, a second small abscess appeared on the ulnar aspect of the forearm, while a third formed in the palm. In addition to these, other abscesses have developed from time to time, one near the middle of the radial side of the forearm, and more recently one rather high up on the posterior surface of the forearm, while at one time there were four present, all on the dorsal aspect of the hand, two over the metacarpal bone of the thumb, one near the base of the second and third metacarpals, and the last just in front of the styloid process of the ulna. At no time has she had any abscesses above the elbow.

The treatment by the continuous galvanic current was persisted in faithfully for a long period, but, as it did not afford any permanent relief, it was finally decided to resort to more positive measures. I advised that one or both of the nerves supplying the affected part, the median and radial, be stretched, and she entered the hospital the 9th of February, 1882. At a consultation with the surgeons, Drs. Hunt and Morton, it was thought well to try specific treatment before resorting to operative measures, and she was, therefore, put on large doses of the iodide of potassium and given mercurials, with, however, no beneficial results. Hence it was finally resolved to stretch the median nerve; but to await the result of this measure before disturbing the radial.

On the 9th of March the median was cut down upon, caught up on a tenaculum and thoroughly stretched, not only by traction, but also by allowing it to support for a minute the full weight of the arm. During the stretching, the pulse was peculiarly affected, becoming slow, hard, and full, the retardation lasting for some two hours after the operation. She reacted well from the ether, but appeared to suffer slightly from shock, the extremities becoming quite cold. The edges of the incision were carefully united by sutures and the hand supported on a straight anterior splint. Toward evening she complained of a burning pain along the course of the nerve extending up to the brachial plexus. But with this exception and that of a slight soreness through the wrist, no trouble ensued, and by the 15th day the wound was entirely healed.

As a result of the operation, the following facts were noticed: Two hours after the operation, the temperature of the right hand, as indicated by a surface thermometer, was two degrees higher than that of the other. Four days later a careful examination by Dr. Morris Lewis disclosed an increased area of dysæsthesia, the loss of sensation apparently including a part of the radial distribution. There was but little of the former pain, but some sense of numbness, while a forming abscess was rapidly crusting over, and a small blister, the sure precursor to an ulcer, which had begun to appear on the back of the hand previous to the operation, had entirely disappeared. Within the third week the pain recurred with all the former severity, and for the next month she had several returns of neuralgia as severe as any former attack, although of short duration. A "sore spot" also appeared on the web, between the thumb and forefinger together with a dull aching of the wrist, and tenderness along the line of the cicatrix.

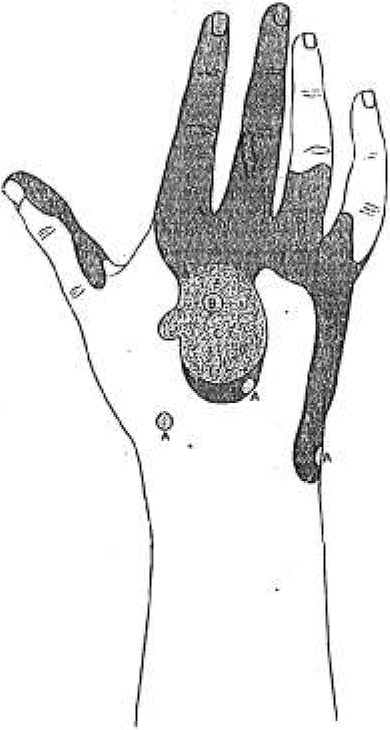
On the 2d of May she was ordered massage of the affected arm from the shoulder downwards, especial care being directed to the kneading of the muscles of the hand. A sedative lotion was also applied, as it appeared to have some favourable influence upon the pain, which was causing her as much suffering as at any previous period. On the 5th of May static electricity was employed daily, an electrode being approximated to either side of the hand and sparks passed through it. This treatment appeared to relieve the pain temporarily, the static current acting more favourably than the galvanic current, in that it produced no burning sensation whatever, while it possessed as marked an influence over the pain.

But none of these measures were of any permanent value; indeed on May 16, a small bleb had made its appearance on the back of the hand and soon ruptured, leaving a superficial ulcer, so that it was evident that the stretching of the median nerve had not resulted in any material relief. A month of grace was yet allowed, but as the matter became gradually worse, on the 14th of June it was thought well to interfere with the radial distribution. Inasmuch as simple stretching of the median nerve had proved ineffectual, it was resolved to employ the more radical treatment of nerve section. The operation was performed under ether by Dr. Hunt, assisted by Dr. Morton, and one and three-quarter inches of the radial nerve were removed just above the wrist. No serious consequences followed, the patient reacting well, though the same slowing of the pulse was remarked as in the previous operation. A straight splint was applied to the forearm with a dressing of lint and cosmoline, while a teaspoonful of the officinal solution of morphia was exhibited internally. The healing of the wound was rapid, and attended with little pain, which was referred wholly to the neck and shoulder, the hand being entirely free from the former aching and burning sensations. On the 30th of June, she was discharged greatly relieved.

At present, November 16, her condition is as follows: She is very much improved in her general appearance, and since the last operation she has had no eruption on the back of the hand, nor any severe pain through the palm. There is, however, a nearly constant aching in the fleshy portion of the hand increased by use, which is also followed by very severe aching sensations in the shoulder and neck similar to those that came on directly after the operations. The first cicatrix causes her no inconvenience whatever, while the second, sensitive even to the friction of the clothing, is still very tender.

Remarks.—It is not the number of cases which adds to our knowledge so much as the care with which each is studied, and in no branch more than in nerve injuries is this illustrated. Unhappily, in the past these cases have fallen almost wholly into the hands of the surgeons, who are largely accountable for the lost opportunities they represent.

Fig. 1.

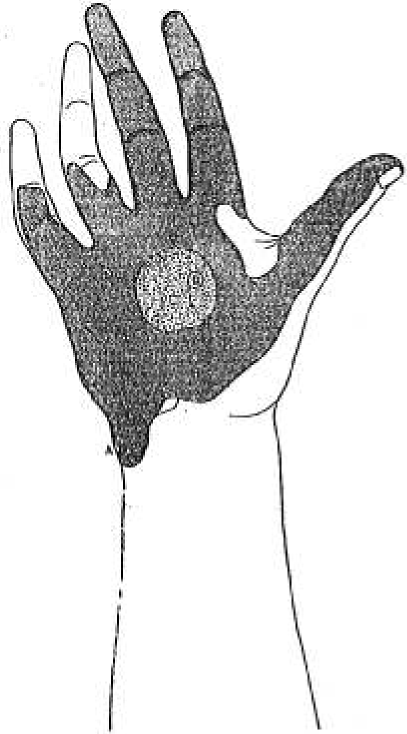


Dorsum.

The present case, of which I have just given a detailed history, will bear some comment. The patient ascribes its onset to the act of milking cows. It seems possible that this might give rise—nay is sometimes known to give rise to loss of power—similar in character to the pareses of the writer—but it appears difficult to comprehend how it could be the parent of such a condition as this person presented when first I saw her. Nevertheless she persists in stating that at first the numbness with which her trouble began was only felt while milking. This may well have been, and yet the act of milking not be responsible for the origin of the disease.

The pain and discomfort were the chief reasons for resort to operation, and there was in my mind much doubt as to what nerve I should attack. For although the herpes and ulcers and much of the pain were distinctly in the radial distribution, the original seat of pain was in the palm at the point of divergence of the median branches. I finally decided to stretch the median. On the 11th of February, two days after an attack of pain,

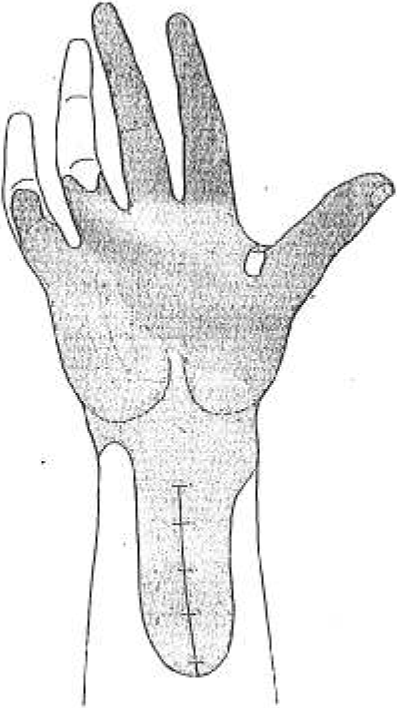
Fig. 2.



Palm.

Dr. Morris Lewis, assistant physician to the Infirmary, made a careful study of the areas of disturbed sensation, and mapped them out in colours on a cast of a hand, as represented in Diagrams Nos. 1 and 2. A careful examination of these figures, and of those made at later dates, will show some of the obscurities which still surround this most difficult question of nerve distribution, and of the effects of stretching or section.

Fig. 3.

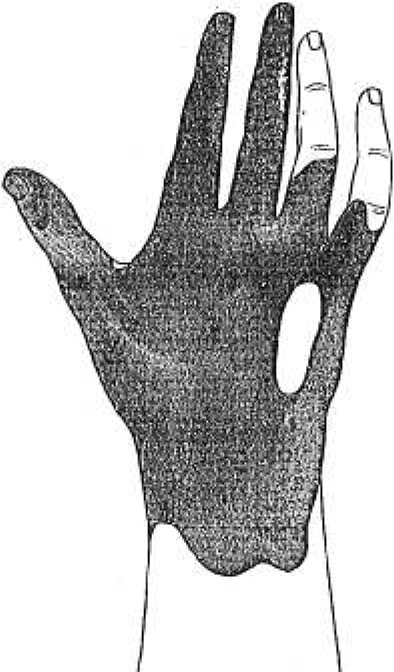


Palm.

The region of dysæsthesia, that is, of defective sensation of touch, is included within the continuous lines. It is remarkably irregular, and covers most of the median, and some of the ulnar and radial territory, but does not include all of any one of these nerve distributions. The regions of ulceration and herpetic eruption are stippled, and the two points of occasional causalgia are marked as B B, and the points where abscesses occurred, by the letter A.

On the 9th of March the median nerve was stretched. I then observed for the first time what is, perhaps, a common phenomenon, the sudden slowing of the pulse at the moment of stretching the nerve. The pulse fell from 98 to 80, and continued to preserve this rate for two hours.

Fig. 4.

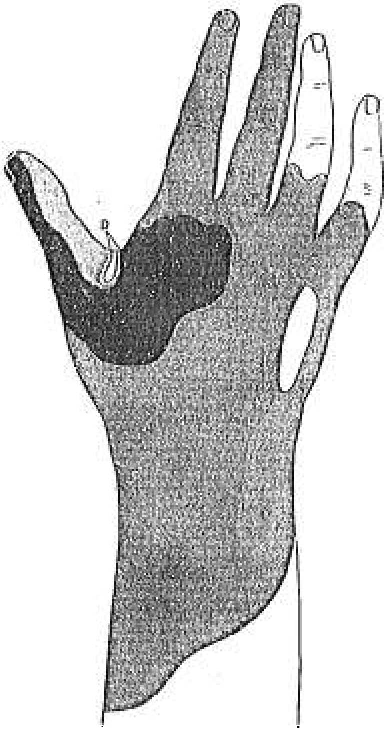


Dorsum.

Stretching raised the temperature two degrees in the median territory precisely as happens after section. On March 28th, nineteen days after the operation, Dr. Morris Lewis made for me the diagrams Nos. 3 and 4.

The area of the original dysæsthesia had widened so as to include regions within the ulnar and radial distribution as well as the median. The space thus lessened in sensibility is remarkable; nor is it possible to explain its extent by any theory of direct effects, or by any unusual distribution of the median. We must, I think, conclude that the centres were in some way widely influenced by the operation. Certainly, the observation is both novel and interesting. The dysæsthesia as to touch so caused was much alike throughout, and the pain sense was merely deadened, not lost, and varied in degree within the affected space.

Fig. 5.

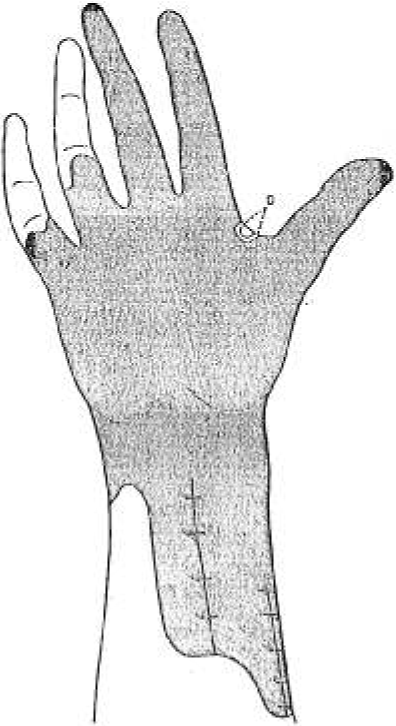


Dorsum.

The first beneficial influence of the operation was to lessen the causalgia and relieve the trophoneurosis. The return of these symptoms after some months, and the continuous increase of pain in the forearm and arm, induced me finally to resort to further measures. Accordingly Dr. Hunt, on the 11th of June, 1882, divided the radial nerve just above the wrist.

The slowing of the heart was again observed, and the usual rise of temperature. *The operation again, and still further, extended the dysæsthesia.* The patch of good sensation in the dorsal ulnar region remained nearly as before, and some slight changes were seen in the dorsal and palmar aspect of the fourth and fifth digits. In the wrist and arm there was a large extension of the dysæsthetic areas, whilst on the back of the hand

Fig. 6.



Palm.

there was found an irregular region shaded black in Diagram 5, within which all sense of pain as well as of touch was lost. This area is of unusual form, since after radial nerve section these losses are not found to be as extensive as in the present case. As a rule, section of the radial leaves the dorsal aspect of several, and sometimes of all of the fingers, more or less insensible to touch, but in the present case there is no increase of the previous defect, nor any added dysæsthesia of the fourth and fifth digits. For what it destroyed and for what it left unaltered this section is remarkable. See Diagrams 5 and 6. It may be noticed in Diagrams 3 and 4, that stretching the median left a little spot of normal feeling at the base of the palmar face of the thumb. Section of the radial left a similar spot rather nearer to the dorsum, at the base of the thumb, but around it was found in addition a narrow band (one line in breadth) of well-marked burning pain and hyperæsthesia. Diagrams 5 and 6 (D).

Amongst the various points of interest in this case, none exceeds in value the abrupt extension of the areas of lessened sensation which was seen after the operations on the median and radial nerves. I have said that this was not to be accounted for upon any knowledge we now have of the peripheral distribution of nerves—since in one case the dysæsthesia spread far beyond the region tributary to the nerve stretched or cut; and, in the other, in some directions did not cover the whole regions usually affected after radial nerve sections. As I have been very watchful of my cases, I can be sure that this is not a common incident of sections of nerves. But it is not altogether new to my experience. Generally speaking, the symptom is to be considered as one of the many forms of shock. A sudden injury to a nerve already morbidly altered gives rise to an inhibition of function in certain closely related centres. The disturbance might be in the direction of motor or of sensory inhibition, and both forms are among the rarer phenomena of nerve wounds from rifle-balls. The fact itself is less surprising than its permanence, nor is it easy to comprehend the precise nature of an influence which may act on such varied functions, and act so persistently.

The curative results of the operation remain after ten months all that I could wish them to be.

CASE II. *Facial Neuralgia, originating in the Left Supra-Orbital Nerve, and finally affecting other branches, relieved by Section of the Infra-Orbital Nerve.*—Mrs. M., æt. 68, had for some years suffered with pain which arose first in the left supra-orbital nerve, and now for some months affected with equal and extreme severity the infra-orbital nerve, and at times the infra-maxillary.

As every imaginable drug had been used, and galvanism failed to relieve, I decided to divide both the supra- and infra-orbital nerves at one sitting.

The case is brought forward to illustrate a point of practical value, and of extreme importance. If I had had to choose which single nerve I should sever, I should certainly have selected the supra-orbital, in which the pain began. It chanced that I was indisposed at the time set for the operation, and therefore sent word to my colleagues, Dr. Hunt, who operated, and Dr. Morton, who assisted him, to go on without me. In this consultation they concluded as a measure of prudence to divide but one nerve, and not being aware of the reasons which would have then led me to choose the supra-orbital, they divided the infra-orbital nerve.

The results were, however, to annihilate pain in all branches of the fifth nerve, and to leave on my mind a most valuable lesson, since nine months later the same satisfactory condition of things still exists.

The mode of reaching this nerve is not a matter of indifference.

In this case the antrum was broken into, and, if I correctly remember, my friend Prof. Brinton, who has operated for me several times on the infra-orbital, prefers this operation. On the whole, however, it seems to me desirable not to break into the antrum. Indeed, I should like in a future case, merely to cut the nerve in front, and again far back in the orbit, and then to leave a small plug of bone or ivory in the little canal, or to close the canal with dental cement. I do not observe that in this case the scar is tender, nor in fact is it apt to be—whilst it is frequently the case when incisions are made on the forearm and a large nerve is cut that the cicatrix remains tender.

CASE III. *Neuralgia of Left Inferior Maxillary Nerve; Extension of Pain to other Branches; Section of Nerve; Return of Pain; Second Section and Obliteration of Canal with Dental Cement, January 28, 1883.*—Miss —, of New Jersey, æt. 43, underwent in April, 1881, by my advice, a resection of the inferior dental nerve on the left side, the operation being performed by Dr. Morton. The case and the immediate results were reported in THE MEDICAL NEWS for March 11, 1882.

After a long period of ease, some time in March or April, 1882, the pain returned in the jaw at the old seat, and in June, 1882, had become as bad as before. The pain had all the usual peculiarities of these neuralgias, and was not limited to the lower nerve, but was felt in both the temporal and orbital branches. At my desire, her home adviser, Dr. Ed. North, of Hammonton, gave her very large doses of aconite, which certainly abolished the pain; but in December, 1882, it returned anew, and in January, 1883, she was readmitted in a pitiable state of suffering. On close study it was found that sensation had been restored in the area figured in my last report of her case as having lost it. In some places the touch sense was still imperfect, but it was nowhere destroyed, and throughout a needle prick could be felt. Clearly the nerve had been remade, and I was again face to face with this difficult question. After exhausting all means at our disposal, it was agreed, in consultation, to seek for the nerve in the canal at the point where formerly it had been severed, and to divide it anew.

At the same time I felt that the operation might fail, like the last one, to give permanent relief, but that at least I should be more secure if I could in some way provide against reunion of the nerve ends. I had thought of plugging the canal with bone or ivory, or of thrusting periosteum into it, but finally decided to fill it with dental cement.

On January 28th, Dr. Morton operated, the patient having been etherized. On exposing the bone, a small trephine was applied about an inch and a quarter in advance of the angle of the jaw, but the canal thus uncovered was ill-defined, and amidst the crushing caused by the trephine, the bleeding, and the obscure cancellous structure, we could find or see no re-made nerve. When the tissues were pushed back a little the old trephine mark was disclosed. It had filled up with bone except for an opening about a line wide, from which projected a button-like prominence, which proved to be a stump of nerve tissue. 'Unhappily the knife had swept over it, and whether or not it furnished filaments running forward *over* the bone cannot now be known.

On trephining, so as to include it, we failed again to trace filaments running along the irregular canal, which certainly existed. The operation enabled us to pull out the nerve trunk some distance, and after stretching to sever it. A more careful search was then made for the filaments presumed to have reconnected the central end with the sensitive skin spaces on the chin. Finding none, the canal was cleaned out, and the two ends of the canal thoroughly filled with warm dental cement, which admits of being easily moulded when hot, and then hardens. What is to be the result of this very novel procedure we have yet to see. Sensation was again destroyed in the region fed by the inferior maxillary nerve, showing that the nerve had been remade and again severed during the operation. At this date—May 10, 1883—there has been a recent return of neuralgic pain, but so far no inflammatory disturbance from the presence of the cement, as to the use of which both Dr. Morton and I have had such anxiety, as naturally attends the use of perfectly new methods. The same mode of obliterating the canal has been more recently resorted to by Dr. Morton in another case of resection of the infra-maxillary nerve.

CASE IV. *Affection of Nerves of Left Arm; Remarkable Lowering of Temperature.*—September 4, 1882. S. M., male, æt. 51, distributing agent in mail car. Has had good health, with the exception of some dyspepsia; has never had syphilis; has used little or no tobacco, and is temperate in all ways.

During the war his right elbow was injured by a ball, the joint subsequently undergoing ankylosis. Owing to this he has been compelled to perform an unusual proportion of work with the left hand, especially in the distribution of mail matter.

About one year ago he noticed a certain loss of power in the fourth and fifth fingers of the left hand without numbness or pain. Two or three weeks subsequently the weakness extended to the other fingers of the left hand, and was then accompanied by some pain in the forearm. At this time (September 5, 1881) he was compelled to give up work, but this weakness has not grown worse since. For the last six months, on the approach of storms, he has had pain extending from the shoulder to the finger-tips.

The pain-sense is somewhat blunted in the hand and the lower half of the forearm. The touch-sense is also defective, and in the finger-tips the limit of confusion of the compass points is six lines.

There is no atrophy in the arm. All the hand muscles are wasted, though not excessively. There is occasional tremor in the index finger, and also in the second finger. Dynamometer, right, 100; left, 60. No loss of mobility in the arm. He can extend and flex the hand, and extend and flex the fingers perfectly, except the third and fourth fingers, extension of which is imperfect. He can oppose the thumb to the forefinger, but not to the other fingers. Is unable to button his clothes, or to pick up any object with the fingers.

The appearance of the unsound hand is singular. It is mottled dark red and pale red, or is throughout of a deep dusky red, especially as to the nails. The skin is smooth rather than glossy, sweats with great ease, and is usually cold to the touch. In fact a subsequent careful examination of the temperature of the two hands showed a remarkable difference. On January 15th, for instance, the sound hand stood at 98.2° Fahr.; the unsound hand 93.4°. After massage for thirty minutes, the temperature became: sound hand, 98.6°; unsound hand, 98.5°.

The next day, January 16th, the hands were, at 10.30 A. M.: sound, 98.7°; unsound, 95°. After reaction, consequent on being out in the cold, they stood: sound hand, 88.8°; unsound hand, 91.2°.

Observations taken subsequently at different times showed the temperature of the unsound hand to fluctuate between 98.8° and 93.2°. On one occasion, when the sound hand showed 97.3°, the unsound one registered 83.2°. During these observations the temperature in the left axilla remained 98.6°.

The reflex actions of the hand are markedly increased. A tap on any portion of the arm below the elbow, whether on muscle or on bone, gives a flexor reflex, which is much more energetic when the tendons are struck. Tapping the extensor tendons in the wrist or hand, gives also a marked reflex action. Direct mechanical irritation, as of a tap with a rubber mallet, will cause fibrillary, or entire contraction in any muscles of the forearm or hand over a space corresponding to the area of the percussing body.

Electrical condition: *F. C.*, Reaction slightly lessened, but present in all the muscles and nerves.

Galvanic C. Quantitative lessening only, the normal formula of polarity, Ka.S.Z.—An. S. z remaining unchanged.

Under the steady use of tonics and galvanic electricity, with daily massage, the hand gradually improved in power, and the pain entirely disappeared.

The remarkable feature of the case was the fall of temperature, a symptom exceptionally rare in examples of any form of neuritis, whether of internal or of traumatic origin, and one which I find it quite impossible to explain. Certainly, in the more frequent cases of inflammation of the nerves of the hand itself with causalgia—absent in this case—there is a rise and not a fall of temperature. In the present instance, a rare one, the nerve tracts on the hand were not sensitive to pressure, the joint and nail lesions were but slight, and the shining skin of causalgia was not well marked. On the other hand, the nerve tracts in the neck, axilla, and arm were tender.

Nothing which we know as yet explains all the clinical phenomena of these interesting cases, and, in all probability, some of the variations in the symptoms are to be attributed to differences in the character of the disorder affecting the nerve trunks, or even to the nature of the causes originating the active-pathological condition.

Thus, when the ulnar nerve is frozen at the elbow, as has been done both by Waller and myself, the temperature rises in the ulnar territories; but, if the experiment be carried too far, and there is, as a consequence, total loss of feeling for some days, the temperature falls and remains for a time below the normal. Now the first effect from freezing is to cause complete but brief loss of sense and motion, due to the fact that below a certain temperature, nerve-trunks cease to carry messages, and then the temperature rises. If, however, according to Waller, the subsequent nerve-changes, probably congestive in their character, be profound enough to destroy the apparent power of the nerves, the temperatures fall. But still more remarkable is it that when the loss of motion and feeling is brought about experimentally by pressure on the nerve-trunks, there is always a fall, and never a rise of temperature in the area fed by the nerve-trunks thus acted upon (Waller).

CASE V. *Dislocation of Left Humerus into Axilla; immediate and increasing Nerve Lesions; unusual Nutritive Changes resembling Abscess; Extravasation of Blood.*—K. B., female, æt. 24, single, a worker on the sewing machine, although delicate, was fairly well until August 1, 1882, when she fell some three feet, and falling on the left side, with her arm outstretched, found on rising intense pain in the left axilla, tingling to the finger ends, and inability due to pain to allow the arm to fall in to the side in a dependent position. So severe was the pain that an injection of morphia merely lessened it, and no ease could be had except by bending to the left so as to allow the arm to form a right angle with the body. On the second day, there was marked weakness in the finger motions, and the tingling became worse. On the sixth day, she came to the city, where one of the surgeons of the Jefferson Medical College Clinic promptly recognized and reduced the dislocation.

Nevertheless the pain and loss of power increased, and a month from the date of the accident the back of the arm and hand began to swell, especially on the ulnar side, and somewhat later the swelling extended to the palm. At first this swelling looked like the not very rare puffiness sometimes seen in the hand after a nerve lesion, but it soon became mottled with extravasated blood, and presented a very threatening appearance, which with varying amounts of pain, lasted until October, 1882, at which time a large blister on the arm brought about a decisive change for the better. As, however, the inhibition of movement due to pain grew less, it became clear that the fingers were almost totally paralyzed.

In December, 1882, the interossei of the hand, and generally all the muscles fed by the ulnar nerve, had wasted exceedingly. January 8, 1883, the patient applied at Dr. Wharton Sinkler's clinic with these conditions.

Left arm somewhat wasted—great atrophy of the interossei—a typical specimen of the "claw hand." There is the very common loss or early return of sensation, it is now difficult to say which. Sensation is nearly normal, except in the palmar surface of the hand and the fourth or fifth digits where the skin is tense, shining, red, and exquisitely sensitive, with a lessening amount of causalgia, while in the forearm only is there constant aching. The swelling above described had totally disappeared, but the joint changes which are usually limited to the fingers affected also the wrist, elbow, and shoulder, and served to add to the great difficulties of the case. The nails were deeply notched by numerous transverse ridges.

Electrical Condition.—F. C. No response except in the following muscles: flexor carpi radialis, flexor longus pollicis, and biceps. The shoulder muscles all respond well, except the deltoid which responds feebly.

G. C. No reaction in the intrinsic hand muscles, except in the adductor pollicis and first dorsal interosseus. *Muscles of forearm.* No reaction in the long extensors of the hand and fingers except in the exten. ossis metacarpi pol. and ext. indicis; these, together with all the long extensors of the hand and fingers, are readily moved by the interrupted galvanic current, but present a changed formula, indicating the reaction of degeneration, as follows: Ka. S. z——An. S. Z.

The biceps, triceps, and deltoid present only a quantitative lessening of response.

The electro-sensibility is abnormally acute.

Ordered galvanism (interrupted) and massage on alternate days.

April 24, 1883. She has persevered in the treatment with regularity. The arm is better in every way, so that she has now little or no pain, and much more voluntary motion. All the muscles of forearm now respond to the galvanic current, although but little change has taken place in the short muscles of the hand.

The nerve lesions arising from dislocations are due rarely to the reducing process; and much oftener as in this case to the injury caused by the accident. In dislocation downward into the axilla, when the force is great, with tear of the capsule and bruise or tear of the circumflex nerve, there is apt to be also injury to the plexus, and in dislocations under the clavicle or under the coracoid process the nerves seem also liable to suffer; but of the liability to nerve-lesion in these several accidents there is yet needed some more precise study. It will be found, I think, that in many dislocations there are slight nerve-lesions, especially in the circumflex nerve, and that their trifling nature has kept them from being noticed by surgeons.

I do not think it very common to find the primary traumatic lesion competent to produce very great loss of sense or motion. There is a little numbness, the bone is replaced, and in a week or two, the secondary changes in the nerve-trunks occasion increasing losses which may prove enduringly disastrous.

Article II.

On Contusions of the Brain and of the Spinal Cord.

By John A. Lidell, A.M., M.D., late Surgeon to Bellevue Hospital, also late Surgeon U. S. Volunteers, etc.

As the inner table of the skull may be fractured by the impact of solid bodies upon the scalp, or upon the exterior of the skull itself, while the outer table remains unbroken (*see the number of this Journal* for April,